

# RJK4013DPE

Silicon N Channel MOS FET  
High Speed Power Switching

REJ03G1513-0100

Rev.1.00

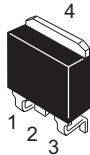
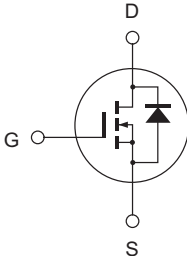
Feb 02, 2007

## Features

- Low on-resistance
- Low leakage current
- High speed switching

## Outline

RENESAS Package code: PRSS0004AE-B  
(Package name: LDKPAK(S)-(1))

1. Gate  
2. Drain  
3. Source  
4. Drain

## Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	$V_{DSS}$	400	V
Gate to source voltage	$V_{GSS}$	±30	V
Drain current	$I_D$	17	A
Drain peak current	$I_{D(pulse)}$ <sup>Note1</sup>	51	A
Body-drain diode reverse drain current	$I_{DR}$	17	A
Body-drain diode reverse drain peak current	$I_{DR(pulse)}$ <sup>Note1</sup>	51	A
Avalanche current	$I_{AP}$ <sup>Note3</sup>	6	A
Avalanche energy	$E_{AR}$ <sup>Note3</sup>	2	mJ
Channel dissipation	$P_{ch}$ <sup>Note2</sup>	100	W
Channel to case thermal impedance	$\theta_{ch-c}$	1.25	°C/W
Channel temperature	$T_{ch}$	150	°C
Storage temperature	$T_{stg}$	-55 to +150	°C

Notes: 1.  $PW \leq 10 \mu s$ , duty cycle  $\leq 1\%$

2. Value at  $T_c = 25^\circ C$

3.  $ST_{ch} = 25^\circ C$ ,  $T_{ch} \leq 150^\circ C$

## Electrical Characteristics

(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	400	—	—	V	$I_D = 10 \text{ mA}$ , $V_{GS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	1	$\mu\text{A}$	$V_{DS} = 400 \text{ V}$ , $V_{GS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	$\pm 0.1$	$\mu\text{A}$	$V_{GS} = \pm 30 \text{ V}$ , $V_{DS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	3.0	—	4.5	V	$V_{DS} = 10 \text{ V}$ , $I_D = 1 \text{ mA}$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.25	0.30	$\Omega$	$I_D = 8.5 \text{ A}$ , $V_{GS} = 10 \text{ V}$ <sup>Note4</sup>
Input capacitance	$C_{iss}$	—	1450	—	pF	$V_{DS} = 25 \text{ V}$
Output capacitance	$C_{oss}$	—	175	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	$C_{rss}$	—	21	—	pF	$f = 1 \text{ MHz}$
Turn-on delay time	$t_{d(on)}$	—	33	—	ns	$I_D = 8.5 \text{ A}$
Rise time	$t_r$	—	28	—	ns	$V_{GS} = 10 \text{ V}$
Turn-off delay time	$t_{d(off)}$	—	84	—	ns	$R_L = 23.5 \Omega$
Fall time	$t_f$	—	15	—	ns	$R_g = 10 \Omega$
Total gate charge	$Q_g$	—	38	—	nC	$V_{DD} = 320 \text{ V}$
Gate to source charge	$Q_{gs}$	—	8	—	nC	$V_{GS} = 10 \text{ V}$
Gate to drain charge	$Q_{gd}$	—	17	—	nC	$I_D = 17 \text{ A}$
Body-drain diode forward voltage	$V_{DF}$	—	0.9	1.5	V	$I_F = 17 \text{ A}$ , $V_{GS} = 0$ <sup>Note4</sup>
Body-drain diode reverse recovery time	$t_{rr}$	—	260	—	ns	$I_F = 17 \text{ A}$ , $V_{GS} = 0$ $di_F/dt = 100 \text{ A}/\mu\text{s}$

Notes: 4. Pulse test

## Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]	Unit: mm
LDBAK(S)-(1)	SC-83	PRSS0004AE-B	LDBAK(S)-(1)/LDBAK(S)-(1)V	1.30g	

Technical drawings showing the package dimensions in millimeters (mm). The drawings include a top view, a side view, and a bottom view, with dimensions and tolerances specified for various features.

Top View Dimensions:

- Width:  $10.2 \pm 0.3$
- Length:  $7.8$
- Lead Pitch:  $2.54 \pm 0.5$
- Lead Width:  $1.7$
- Lead Spacing:  $1.3 \pm 0.2$
- Lead Length:  $1.37 \pm 0.2$
- Lead Thickness:  $0.86^{+0.2}_{-0.1}$
- Lead Angle:  $3.0^{+0.3}_{-0.5}$

Side View Dimensions:

- Package Height:  $4.44 \pm 0.2$
- Lead Height:  $1.3 \pm 0.15$
- Package Body Height:  $2.49 \pm 0.2$
- Package Body Thickness:  $0.1^{+0.2}_{-0.1}$
- Lead Thickness:  $0.4 \pm 0.1$

Bottom View Dimensions:

- Package Body Width:  $6.6$
- Package Body Length:  $7.0$
- Lead Length:  $2.2$

## Ordering Information

Part No.	Quantity	Shipping Container
RJK4013DPE-00-J3	1000 pcs	Taping

Note: For some grades, production may be terminated. Please contact the Renesas sales office to check the state of production before ordering the product.

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